



DRAFT
City of Mesa
Engineering

Noche De Paz Lift Station & Sulfide Control Station Rehabilitation

Design Concept Report
November 13, 2024

City of Mesa
Project No. CP0958LS01



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1. Introduction

The existing City of Mesa Noche De Paz Lift Station (LS) and Sulfide Control Station (SCS) was constructed in 1975 and rehabilitated in 2002. The site is located at 2738 S Noche De Paz at the northwest corner of the intersection of Noche De Paz and Guadalupe Road. The LS discharges to a gravity sewer approximately 50-ft north of the wet well. Figures 1 and 2 below show the site and service area respectively.

Existing LS & SCS components include:

- 32.6-ft deep, 8-ft diameter wet well
- Two submersible pumps, 1,100 gpm at 36-ft TDH each
- 8" above ground discharge piping and valves
- Natural gas emergency generator
- 6,000 gallon Ferrous Chloride (FeCl₂) storage tank
- Three FeCl₂ metering pumps located inside a CMU block building
- 21" vitrified clay pipe (VCP) gravity sewer influent line
- 14" ductile iron (DIP) force main
- 21" VCP overflow drain pipe
- 8" DIP bypass FM and bypass controls
- 10-ft tall slump block perimeter wall
- 20-ft wide double swing gate

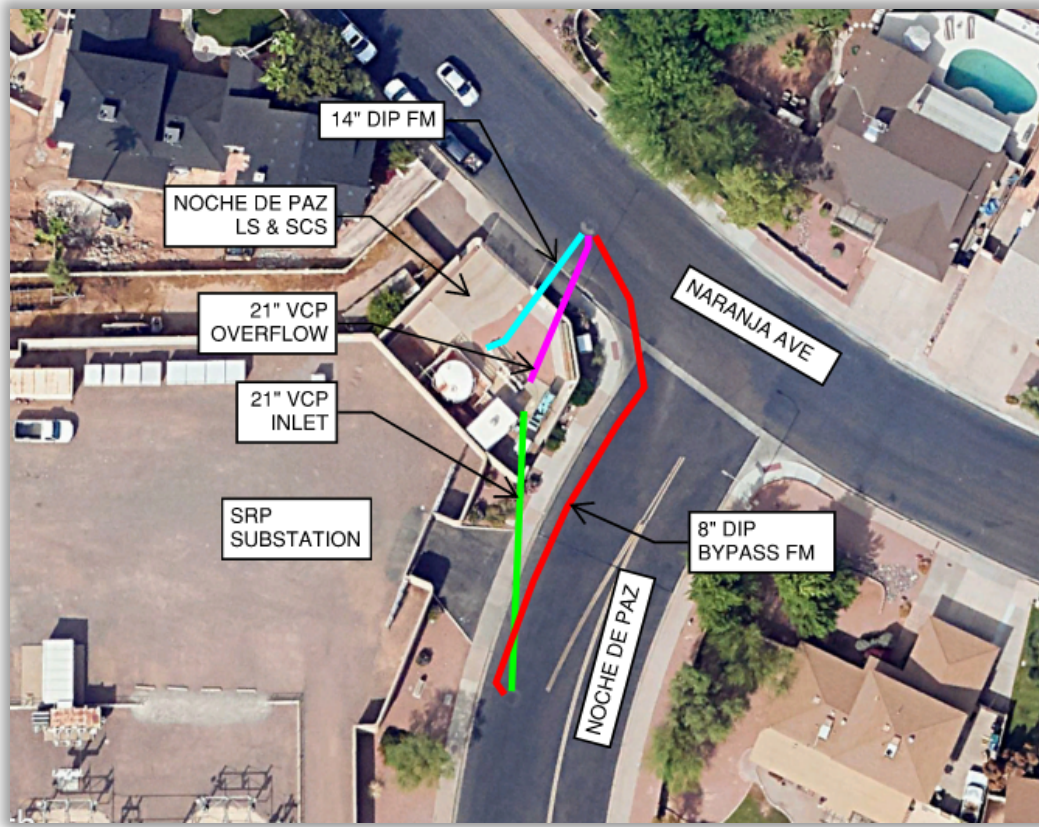


Figure 1 – Overall Site Location

- New wet well hatch and safety grating, opening toward the discharge piping.
- Install horizontal swing type check valves.
- Install Cam-Lock fitting for backup connection.
- Install H-TEC Model 986-01 stainless steel combination air valves.
- Install Ultrasonic flow meter.
- Install “goose neck” on discharge piping so flow meter remains flooded with water.
- Install wet well wizard with controls for always on, run with lead pump, run with pump 1, or run with pump 2.
- Replace existing 14” DIP FM with 8” C900 PVC FM.
- Rehabilitate existing 21” VCP overflow pipe with Cured-In-Place-Pipe (CIPP) liner.
- Rehabilitate and recoat existing inlet manhole and bench.
- Rehabilitate and recoat existing outlet manhole and bench.
- Replace existing 1” water service with 2” water service.
- Rehabilitate existing 21” VCP inlet sewer pipe with CIPP liner.
- Utilize or rehabilitate existing 8” DIP bypass FM and controls. The condition of the existing bypass FM is unknown, and assessment is not part of this scope. The bypass FM shall be evaluated for reuse or rehabilitation during the design phase.
- Repaint all site gates and replace wood slats with synthetic slats.
- Install fence inside of site to isolate transformer from the site.
- Install new decomposed granite within the site.
- Replace site eyewash/showers.
- Install canister filter on chemical fill station.
- Replace 6,000 gal FeCl₂ fiberglass tank. A platform will not be provided to match existing conditions due to the proximity to adjacent homes.
- Coat containment basin area and building floor.
- Replace 3 metering pumps, piping, and controls. Provide skid mounted pumps. One pump will dose the upstream manhole, one pump will dose the wet well, and one pump will be provided for backup. Include Red Lion OIT panel.
- Remove and replace existing natural gas generator.
- Install new Service Entrance Section (SES) outside of site wall.
- Pressure transmitter and flow meter readings incorporated into SCADA.
- Create 18” air gap terminations for the pumps.
- Replace tank level transducer with Pulsar Ultra 4 level controller.
- Replace wet well transducer and floats.

3. Design

3.1 Submersible Pumps

The City verified that the Noche De Paz service area is built out and no additional flows are expected in the future. The City Lift Station Inventory lists an average flow of 826 gpm and peak flow of 1,310 gpm for Noche De Paz, and The City Sewer Model provides an average flow of 326 gpm and 426 gpm peak. Due to this large discrepancy, GHD requested available flow monitoring data for the lift station from the City. The City provided past flow monitoring at upstream manhole MH698, which indicated an average flow of over 2,000 gpm. This greatly exceeds the other data, exceeds the capacity of the existing pumps, and would produce a FM velocity much greater than the City limit of 7 ft/s. The City indicated that the inlet sewer is currently surcharging, which can explain the higher upstream flow monitoring values since the surcharged standing water can impact the flow readings.

GHD then requested new flow monitoring data at the downstream manhole MH716. Appendix B includes a representative portion of the MH716 flow monitoring. The raw data shown in blue clearly shows the pumps cycling but indicates that the flow never goes below 600 gpm, even in the middle of the night when the pumps are not running. This did not appear accurate since most of the flow at MH716 is coming from the Noche De Paz LS.

The City then physically observed flows at MH716 in the early morning and verified that there is no flow in the MH when the pumps are off and measured a depth in the 21" VCP sewer of 9-1/2" when the pumps were running. Assuming a 21" VCP minimum slope of 0.001 ft/ft, this depth equates to a pumping flowrate of approximately 1,100 gpm. The orange flow line in Appendix B represents the adjusted flow data to remove the 600 gpm baseline flow that the City verified did not exist. The difference between the peak and valley shown on the graph in Appendix B represents the pumping flow rate from the flow monitoring and matches the flow from the City's physical observation of approximately 1,100 gpm. This also matches the calculated existing pump and system curve performance shown on Figure 3 below. The calculated average day flow from the adjusted orange line in Appendix B is equal to 600 gpm. Based on the downstream flow measurements and City's physical observation, the following existing flows will be utilized for design:

- Average flow = *600 gpm
- Peak flow = 1,100 gpm

*The City has indicated that actual average day flow may be less than the selected design flow of 600gpm. A lower average day flow will not impact operational performance as flows can be as low as 200 gpm to maintain the required maximum retention time of 30 minutes.

Figure 3 and Table 3.1 below shows the system curve and head loss calculations for the existing pumps. Figure 4 and Table 3.2 shows the system curve and head loss for the proposed pumps with the deeper wet well and pump data for the proposed pumps is located in Appendix C.

- Proposed pumps - Flygt NP 3153, 1,100 gpm @ 42' TDH

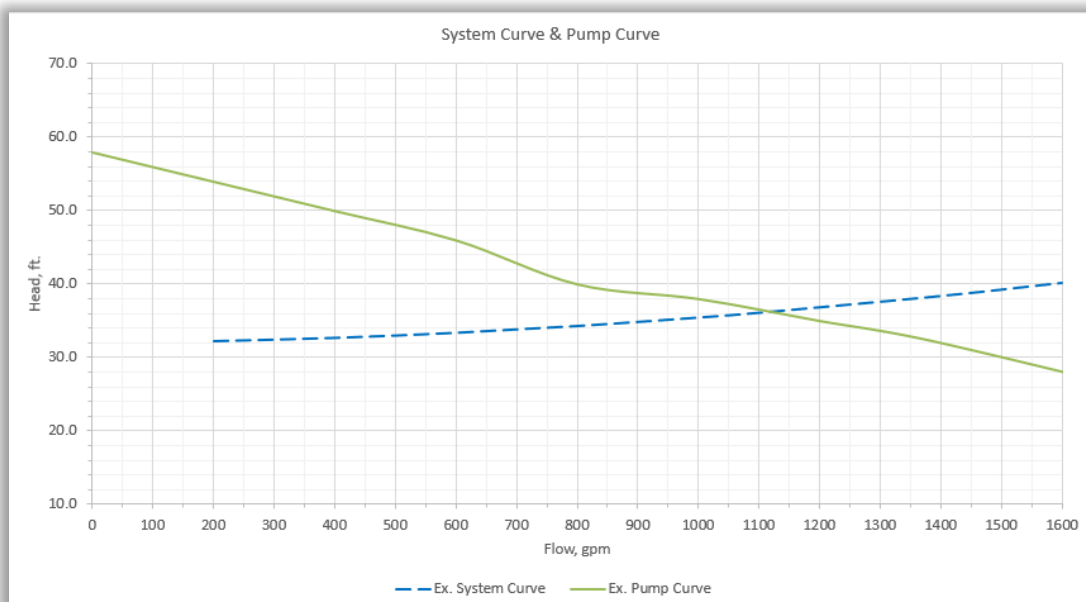


Figure 3 – Existing System Curve

Flow =		1100										
Headloss Calculations:												
Pipe Dia, in	Length, ft	Flow, gal/min	System Component	No. of Comp.	Equivalent Comp. Length, ft	Equivalent Length, ft	Velocity, ft/s	$V^2/2g$	C	h_f per 100 ft	Actual h_f	Cumm. Head
8.4	45	1100	DIP	1	45	45	6.37	0.63	130	1.68	0.76	0.8
14.4	40	1100	DIP	1	40	40	2.17	0.07	130	0.12	0.05	0.8
8.4	1100	1100	90° Bend	5	20	100	6.37	0.63	130	1.68	1.68	2.5
8.4	1100	1100	Swing Check Valve	1	33	33	6.37	0.63	130	1.68	0.56	3.0
8.4	1100	1100	Plug Valve (Thru)	3	k = 0.25		6.37	0.63	-	-	0.16	3.2
8.4	1100	1100	Tee Branch	1	39.9	39.9	6.37	0.63	130	1.68	0.67	3.9
8.4	1100	1100	Flow Meter	1	13.3	13.3	6.37	0.63	130	1.68	0.22	4.1
Total Headloss (Rounded), ft =											4.1	
Pump Off Elevation, ft =											1165.3	
Elevation of Highest Point in FM, ft =											1197.3	
Static Head, ft =											32.0	
TDH (Rounded), ft =											36.1	

Table 3.1 – Existing System Head Loss Calculation

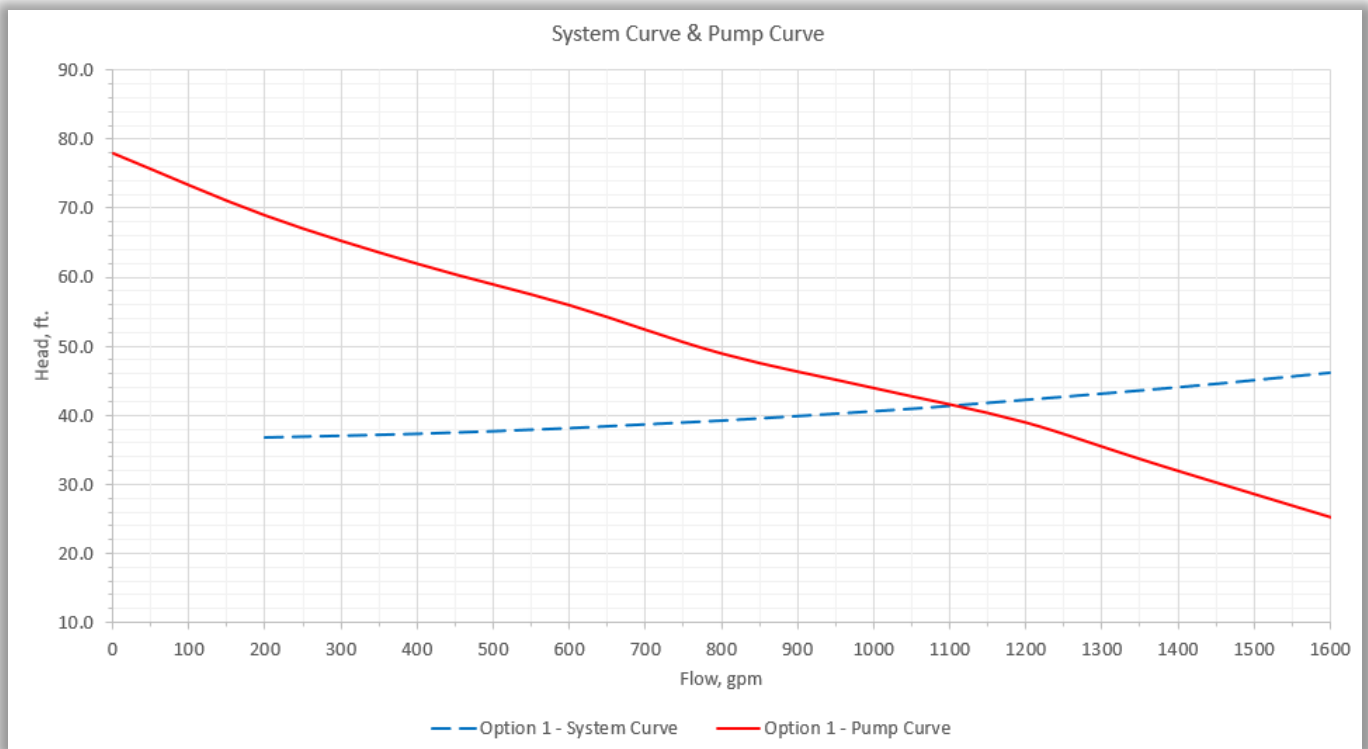


Figure 4 – Proposed System Curve

Flow =		1100										
Headloss Calculations:												
Pipe Dia, in	Length, ft	Flow, gal/min	System Component	No. of Comp.	Equivalent Comp. Length, ft	Equivalent Length, ft	Velocity, ft/s	V ² /2g	C	h _f per 100 ft	Actual h _f	Cumm. Head
8.4	45	1100	DIP	1	45	45	6.37	0.63	130	1.68	0.76	0.8
8.4	40	1100	DIP	1	40	40	6.37	0.63	130	1.68	0.67	1.4
8.4		1100	90° Bend	5	20	100	6.37	0.63	130	1.68	1.68	3.1
8.4		1100	Swing Check Valve	1	33	33	6.37	0.63	130	1.68	0.56	3.7
8.4		1100	Plug Valve (Thru)	3	k = 0.25		6.37	0.63	-	-	0.16	3.8
8.4		1100	Tee Branch	1	39.9	39.9	6.37	0.63	130	1.68	0.67	4.5
8.4		1100	Flow Meter	1	13.3	13.3	6.37	0.63	130	1.68	0.22	4.7
Total Headloss (Rounded), ft =											4.7	
Pump Off Elevation, ft =											1160.6	
Elevation of Highest Point in FM, ft=											1197.3	
Static Head, ft =											36.7	
TDH (Rounded), ft =											41.4	

Table 3.2 – Proposed System Head Loss Calculation

3.2 Wet Well Sizing

The existing wet well volume does not meet the City’s desired 4 pump starts per hour maximum per the calculations below:

- Minimum Pumping Volume Calculation (4 starts per hour): $V = (t \times q) / 4$
 - V = Volume between 1st pump start level and pump stop level
 - t = minimum time between successive pump start (15 min)
 - q = single pump capacity at the design point
 - **$V = (15 \text{ min} \times 1,100 \text{ gpm}) / 4 = 4,125 \text{ gal (551 ft}^3\text{)}$**

The available pumping volume in the existing wet well without surcharging is calculated below:

- 8-ft diameter wet well cross-sectional area = 50.3 ft²
- Distance between pump on & off setting = 2.6 ft
- **Existing Available Pumping Volume = 2.6 ft x 50.3 ft² = 131 ft³ (978 gal).**

Table 3.3 below summarizes the available pumping volume and starts per hour for the proposed 38.2-ft deep, 10-ft diameter wet well per the section in Appendix A.

Data Set	Ave. Flow In (gpm)	Pumping Rate (gpm)	Pumping Volume (gal)	Fill time (min)	Pumping Duration Time (min)	Retention Time (min.)	Cycle Frequency per Hour	Starts per Hour per Pump
New Wet Well	600	1100	4,172	7.0	8.3	15.3	3.9	2.0

Table 3.3 – Retention Time & Pump Cycling

3.3 Pipe Sizing

The proposed pumping rate of 1,100 gpm and discharge piping size of 8” will match existing conditions. The buried section of existing 14” force main is oversized and can be reduced to 8”. At 1,100 gpm, the velocity in the 8” discharge pipe and force main will be 6.5 ft/s. Option 3 includes VFD drives that would reduce the flow to 750 gpm during average flow to reduce pump cycling. At 750 gpm, the velocity in the 8” discharge pipe and force main will be 4.3 ft/s. Both velocities meet the City’s preferred requirement of 4 – 7 ft/s.

4. Maintenance of Plant Operation (MOPO)

A permanent 8" DIP bypass FM and controls were installed with the site rehabilitation in 2002. The bypass FM extends from the inlet sewer manhole to the discharge manhole. Jensen Engineering evaluated the existing temporary controls, cables, and floats and determined that they can be reused for bypass pumping during rehabilitation as discussed in Section 5 below. New temporary bypass pumps will need to be installed inside of the inlet manhole and connected to the existing controls and bypass FM. Figure 5 below illustrates the existing bypass improvements. Temporary chemical storage and injection equipment will also be required during construction.

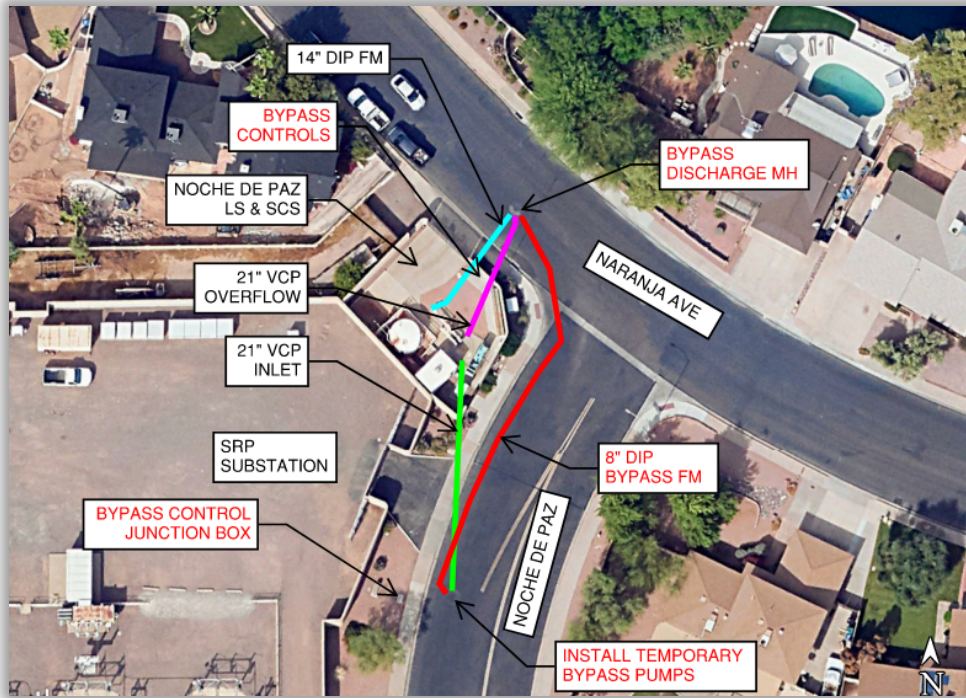


Figure 5 – Existing Bypass & Controls

5. Electrical

5.1 Lift Station (LS6)

The Lift Station is currently fed from a 200 amp, 480/277VAC, three phase service from Salt River Project. This site requires a new service entrance section to be relocated to the exterior eastern wall of the site. This will be fed from an existing transformer located in the southeast corner of the lift station. It is anticipated the upgraded pump motors match the existing motors in size. An increase in service capacity is not anticipated.

The existing electrical motor control center (MCC) contains the service entrance section, automatic transfer switch, pump starters and PLC cabinet. The MCC feeds a 30KVA 3 phase mini power zone panel for 208/120VAC distribution. This panel will be removed. The entire MCC will be removed and replaced with either a new MCC with a transformer and panelboard, or a pump control panel with separate 480:208Y/120VAC transformer to feed a new stand-alone 208/120VAC panelboard LPA.

A new Service Entrance Section will be required. This panel will be located in the new gated SRP access area next to the existing SRP transformer, or on the exterior wall next to the access gate for this area.

There are two options to consider for the electrical control and distribution for this lift station. A MCC is used for the existing lift station. The first option is to match the existing MCC, which would contain the motor starters and may also contain the automatic transfer switch, a 208Y/120VAC transformer and panelboard. The second option matches the installations at the Warner Road Lift Station and Center Street Lift Station. This option provides a separate pump control panel, which contains the pump starters. The automatic transfer switch, transformer and 208Y/120VAC panelboard will all be stand-alone items. City Process Controls has chosen the second option to match the Warner Road and Center Street Lift Stations.

The existing 100KW generator is past its useful life and needs to be replaced. It is anticipated the new generator will be a natural gas powered 100KW generator to match existing. This will provide adequate backup power for the entire site. A new Automatic Transfer Switch is required.

The existing pumps and motors are anticipated to be replaced in kind with 20HP 480V 3 phase motors. These will be connected to a new pump control panel that will contain the new starters. New conductors will be installed for the new pump motors and will use all new conduits. New conduit and conductors from the new pump motor junction boxes and the new terminal junction boxes will be required.

The existing flow meter will be replaced with a new full bore ultrasonic flow meter. The wet well level transducer will be replaced with a new ultrasonic level transducer by pulsar. Both the flow meter and level transducer will connect to the new RTU panel. New conduit and conductors for these instruments will be required.

All existing site lighting is to be replaced with new LED lights. These lights will be powered out of a new 208/120VAC panelboard.

5.2 Bypass Pumping System.

There is an existing bypass pump control panel and Mini-Power Zone panel, that can be used during the construction on the wet well. The bypass pump control panel is sized to operate two 20HP pumps and has connections for four level floats. This panel appears to be in good condition. The Mini Power Zone panel is used to provide 120VAC control power for the pump control panel. To power the pump control panel and the Mini Power Zone panel, a new 480/277VAC 100 amp temporary electrical service meter panel and transfer switch will be required. The original service panel and transfer switch have been removed. The electrical feed for this system was re-connected to a circuit breaker located in the lift station motor control center.

Conduits from the bypass pump control panel to the bypass manhole are in place. We anticipate these conduits can be reused. These conduits contain existing conductors. We recommend replacing these conductors with new prior to energizing this station.



Figure 6 – Existing Bypass Pump Control Panel

5.3 Sulfide Control Station (SS3)

The Sulfide Control Station is powered from the existing Mini Power Zone panel that is to be removed.

There are 2 chemical feed pumps which will be replaced by a new skid mounted system. The system will be powered out of the low voltage power panel LPA located within the MCC (if provided) or stand-alone. It is anticipated the size of the pumps and motors will be similar to the existing size. Each pump will be driven by variable speed drives (VFDs). The VFDs will be controlled through a pump control panel. The new pump control panel will communicate with the main PLC panel for SCADA monitoring. The pump control panel will come equipped with a new HMI for local operator control. The new HMI will adhere to the City of Mesa recent standards.

The existing chemical tank is to be removed and replaced. The new tank will require radar level transducers by Pulsar. A receptacle will be provided for a portable sump pump for the containment area.

5.4 RTU Panel

The existing PLC is located in the MCC lineup. The PLC has recently been upgraded to a Modicon M340. The MCC will be removed and replaced. The existing PLC will be installed in the new separate RTU control panel enclosure separate from the MCC. This site is located in a housing development and the current PLC communicates by radio. A new radio path study may need to be conducted to determine the new height of the communications pole. There is no fiber on site, and it is anticipated that no future fiber will be installed near or at the site.

Below is a list of anticipated signals to be sent to SCADA for monitoring:

- Wet Well Level
- Wet Well High Level
- Lift Pump Remote Mode (2)
- Lift Pump Running (2)
- Lift Pump Fault (2)
- Lift Pump VFD Speed (2). (If VFD operation is chosen)
- Lift Station Pump Discharge Pressure
- Lift Station Pump Discharge Flow
- MCC Intrusion Alarm
- RTU Intrusion Alarm
- Site Intrusion Alarm
- Generator Running
- Generator Alarm
- Utility Power On
- Standby Power On
- Chemical Tank Level
- Chemical Feed Pump Speed (2)
- Chemical Feed Pump Speed Command (2)
- Chemical Feed Pump Run Command (2)
- Chemical Feed Pump Fault Alarm (2)
- SCS Intrusion Alarm

The existing discharge flow meter is a magnetic flow meter. This will be replaced with an ultrasonic flow meter. The containment area will have a sump and a receptacle for a plug-in sump pump. The sump will be operated manually based on visual inspections of City personnel. The containment area will not be equipped with a level sensor for flood indication, as these are proving to be a nuisance. A rate of drop alarm can be programmed into the PLC to indicate a significant leak in the chemical tank for safety.

6. Opinion of Probable Cost

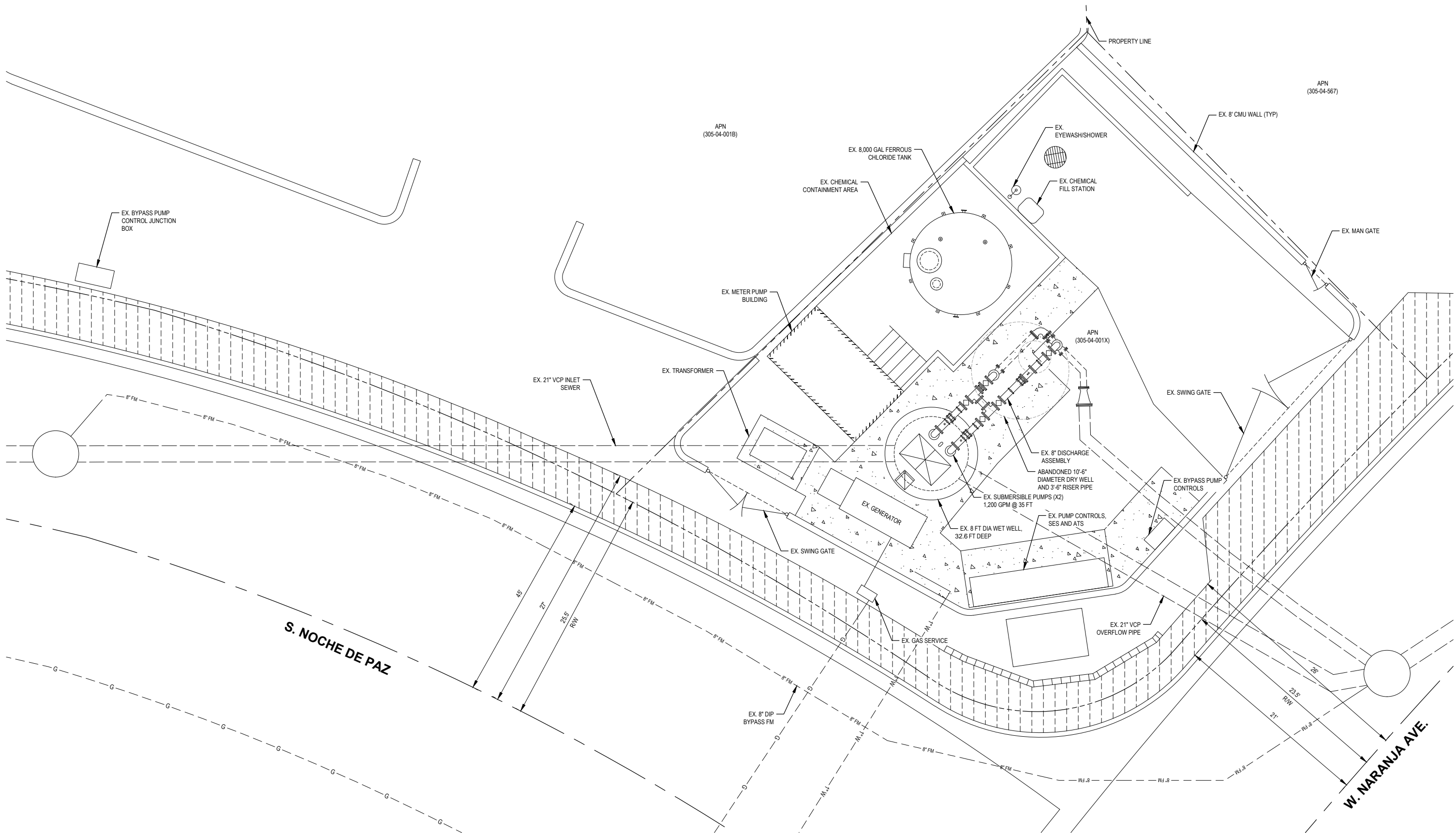
The preliminary Opinion of Probable Costs for each option are included in Appendix D and is summarized in Table 6.1 below. A 10% project contingency has been included along with a 15% market escalation factor to reflect recent market volatility and potential material and labor price increase at the time of construction.

Table 6.1 Preliminary Opinion of Cost Summary

Description	Cost
Materials & Labor	\$2,538,515
10% Project Contingency	\$253,851
15% Market Escalation Factor	\$380,777
15% Overhead & Profit	\$475,971
3% Bond & Insurance	\$95,194
TOTAL	\$3,744,309

Appendix A

Conceptual Plans




EXISTING SITE PLAN

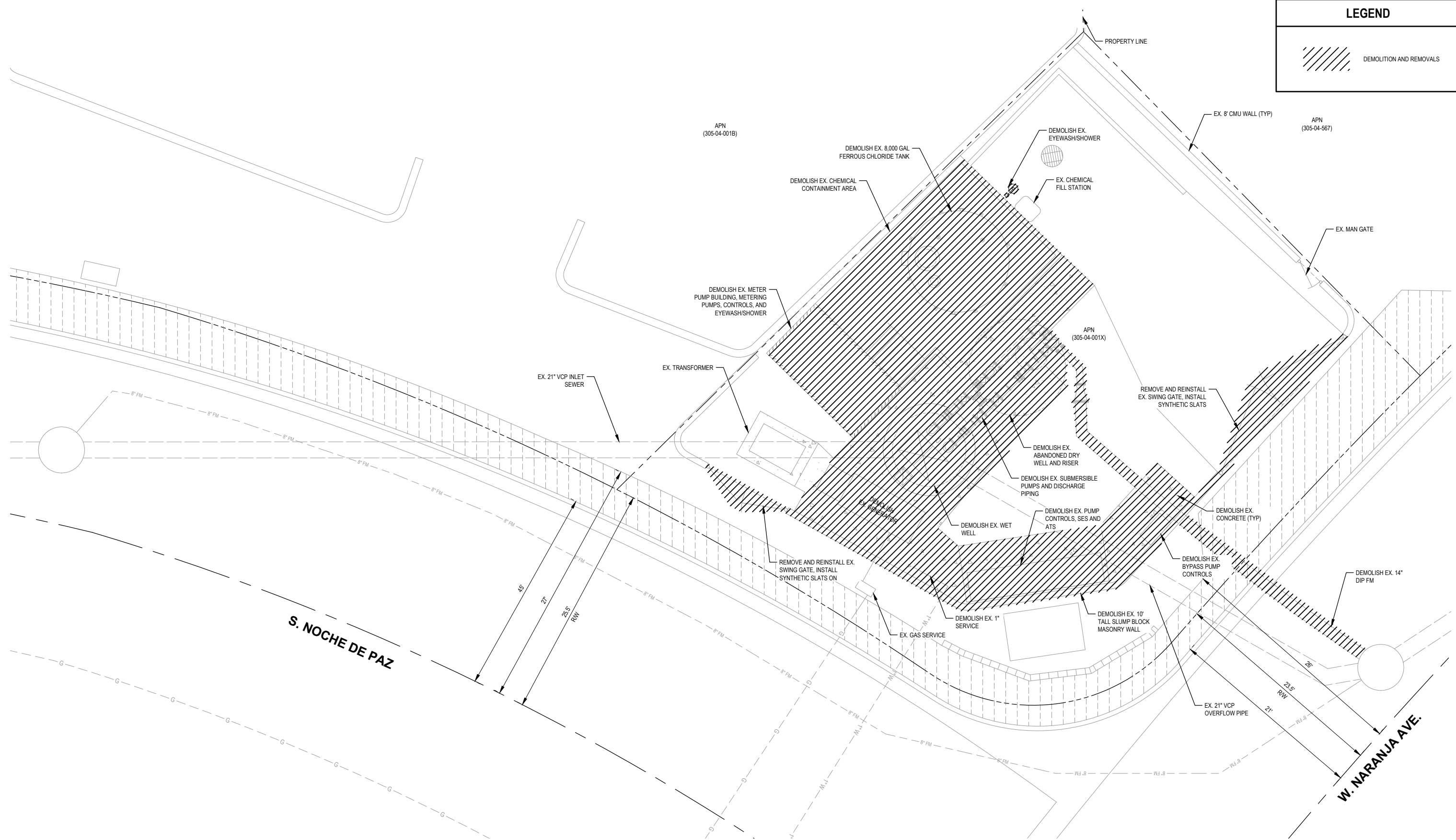
SCALE: 1" = 5'



CITY OF MESA
LIFT STATION IMPROVEMENTS
NOCHE DE PAZ
EXISTING SITE PLAN

Project No. 12577360
 Report No. N/A
 Date OCTOBER 2024

LEGEND	
	DEMOLITION AND REMOVALS

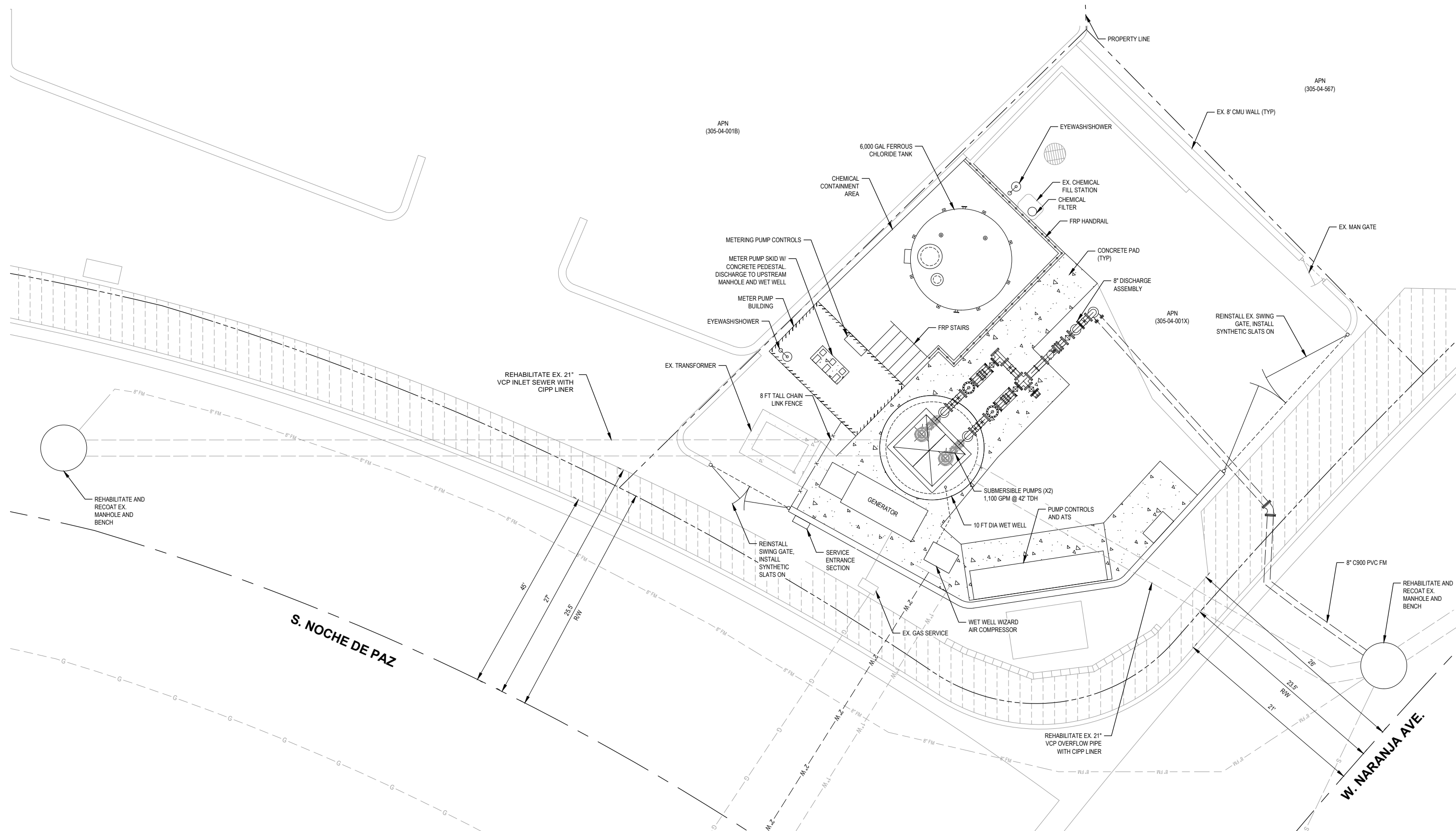


DEMOLITION PLAN
SCALE: 1" = 5'



CITY OF MESA
LIFT STATION IMPROVEMENTS
NOCHE DE PAZ
DEMOLITION PLAN

Project No. 12577360
Report No. N/A
Date OCTOBER 2024

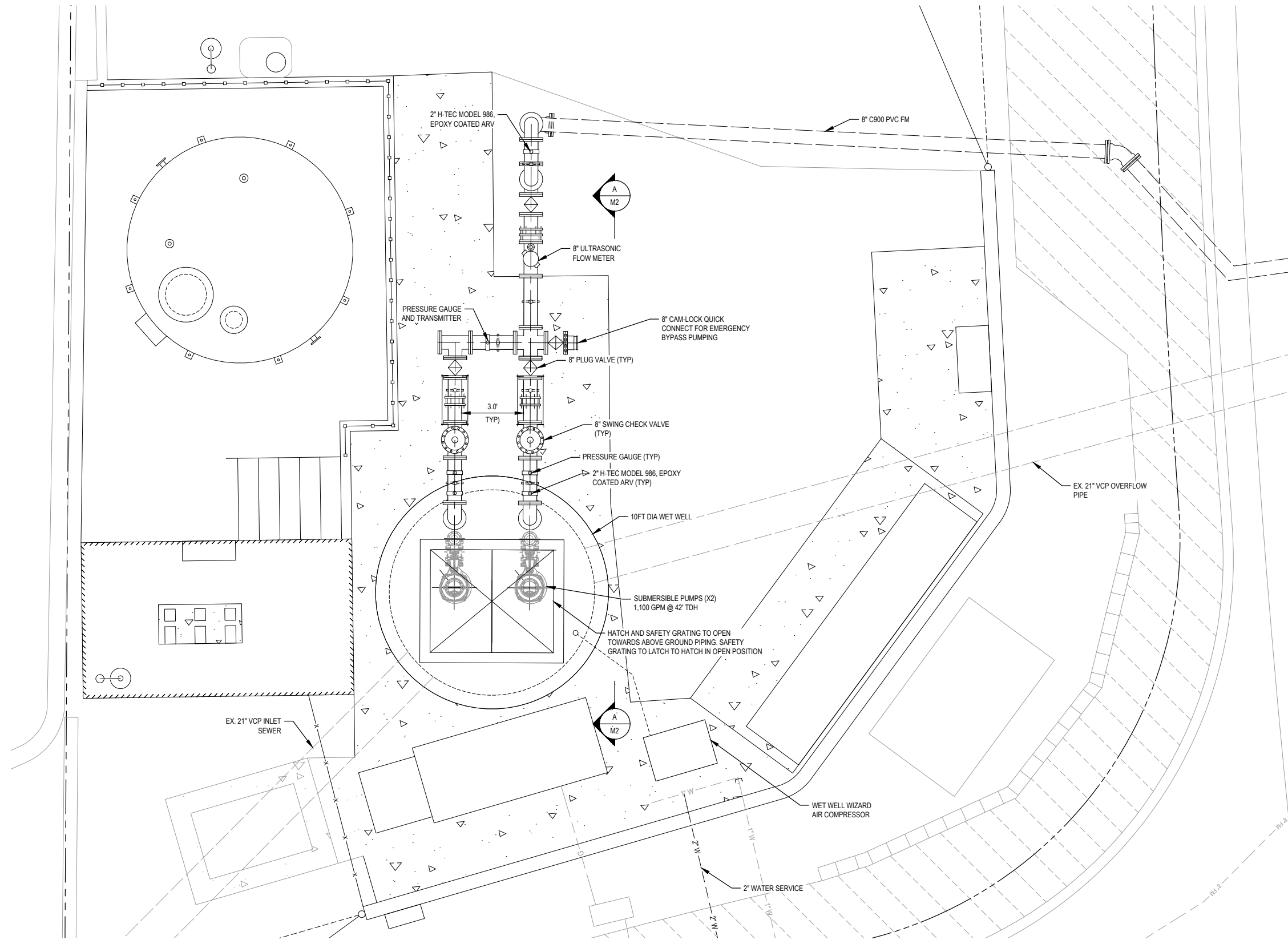


PROPOSED SITE PLAN
SCALE: 1" = 5'



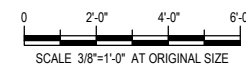
CITY OF MESA
 LIFT STATION IMPROVEMENTS
 NOCHE DE PAZ
PROPOSED SITE PLAN

Project No. 12577360
 Report No. N/A
 Date OCTOBER 2024



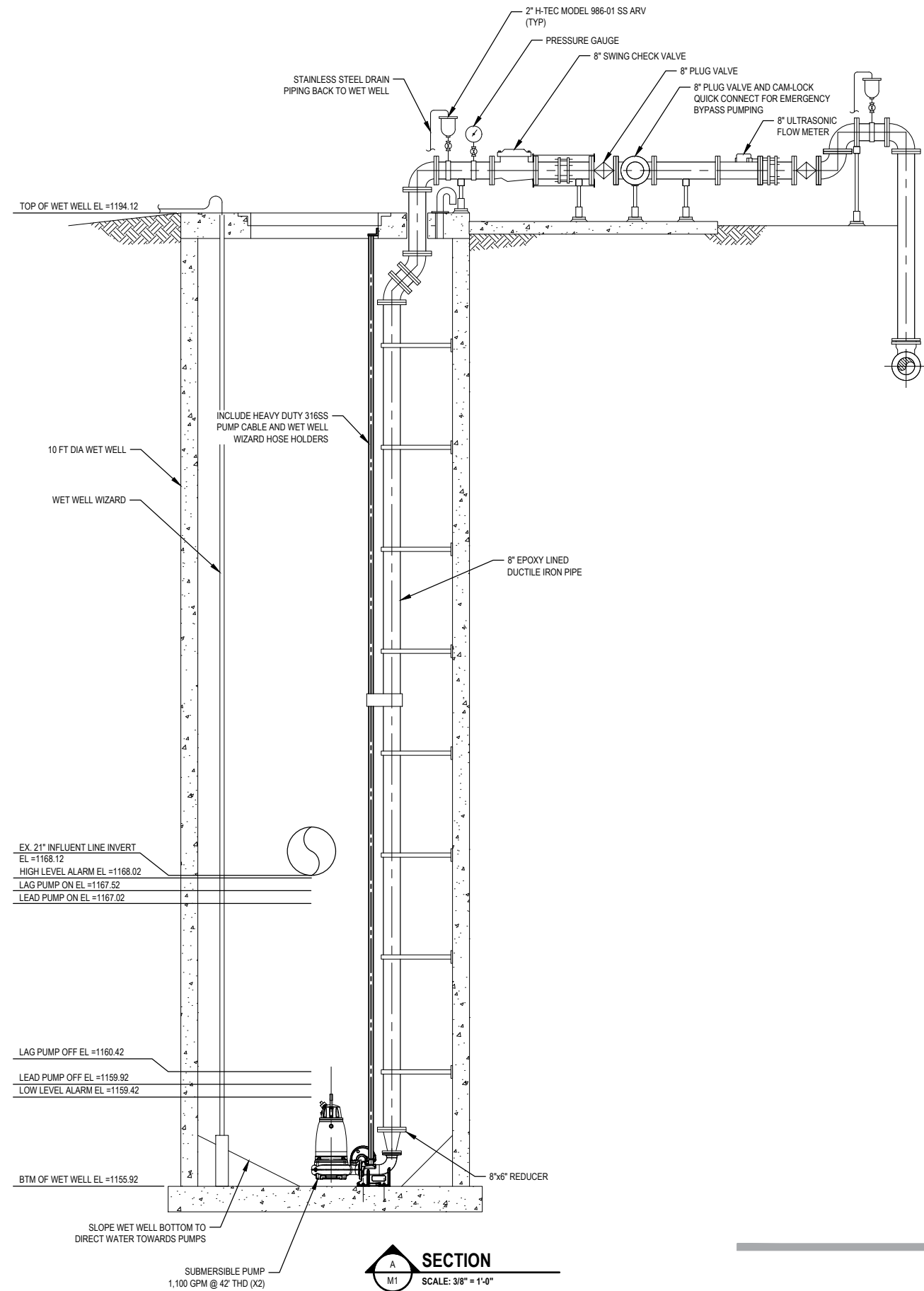
PROPOSED LIFT STATION PLAN

SCALE: 3/8" = 1'-0"

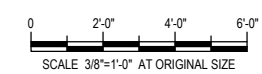


CITY OF MESA
 LIFT STATION IMPROVEMENTS
 NOCHE DE PAZ
PROPOSED LIFT STATION PLAN

Project No. 12577360
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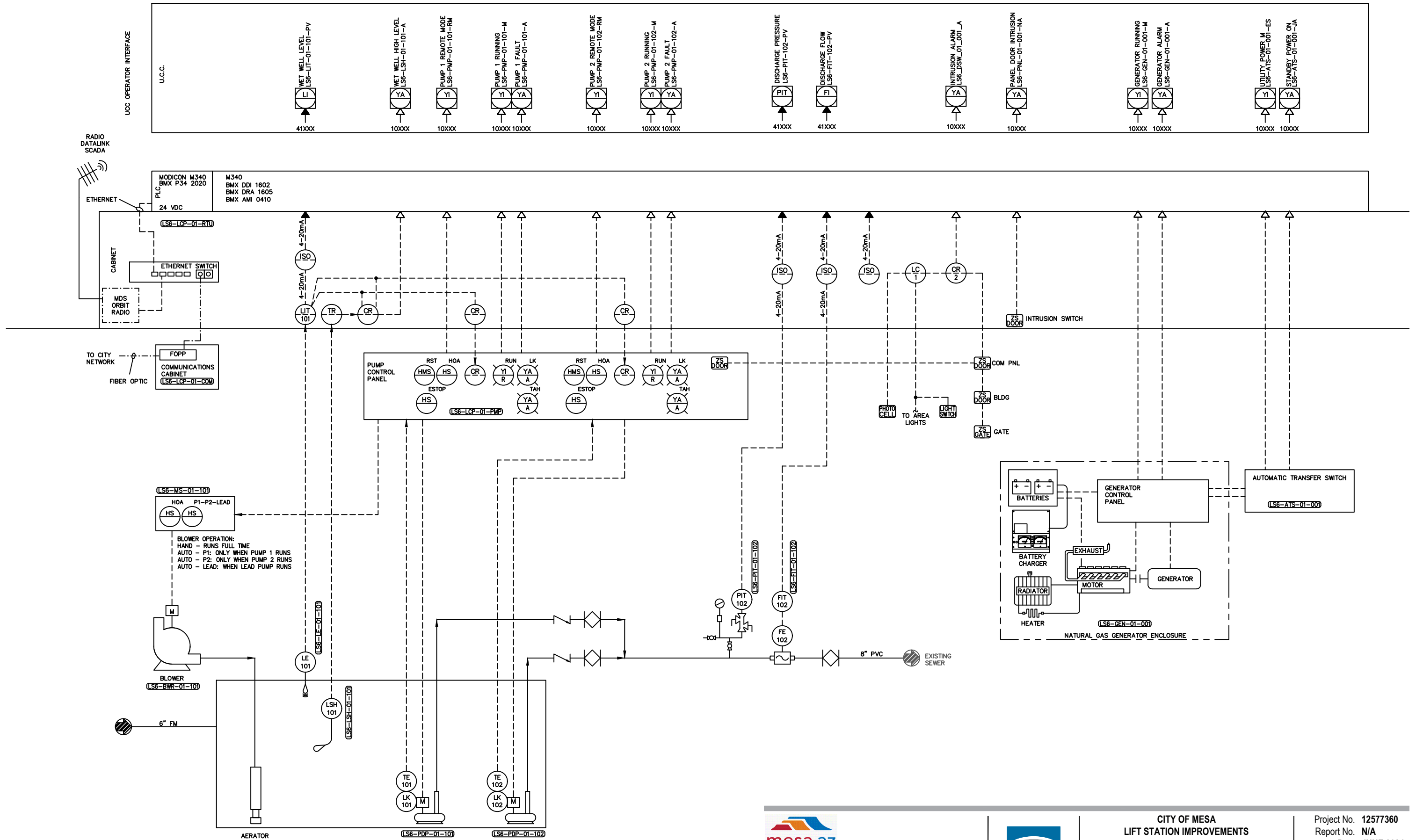


SECTION
M1
SCALE: 3/8" = 1'-0"



CITY OF MESA
 LIFT STATION IMPROVEMENTS
 NOCHE DE PAZ
 SECTIONS

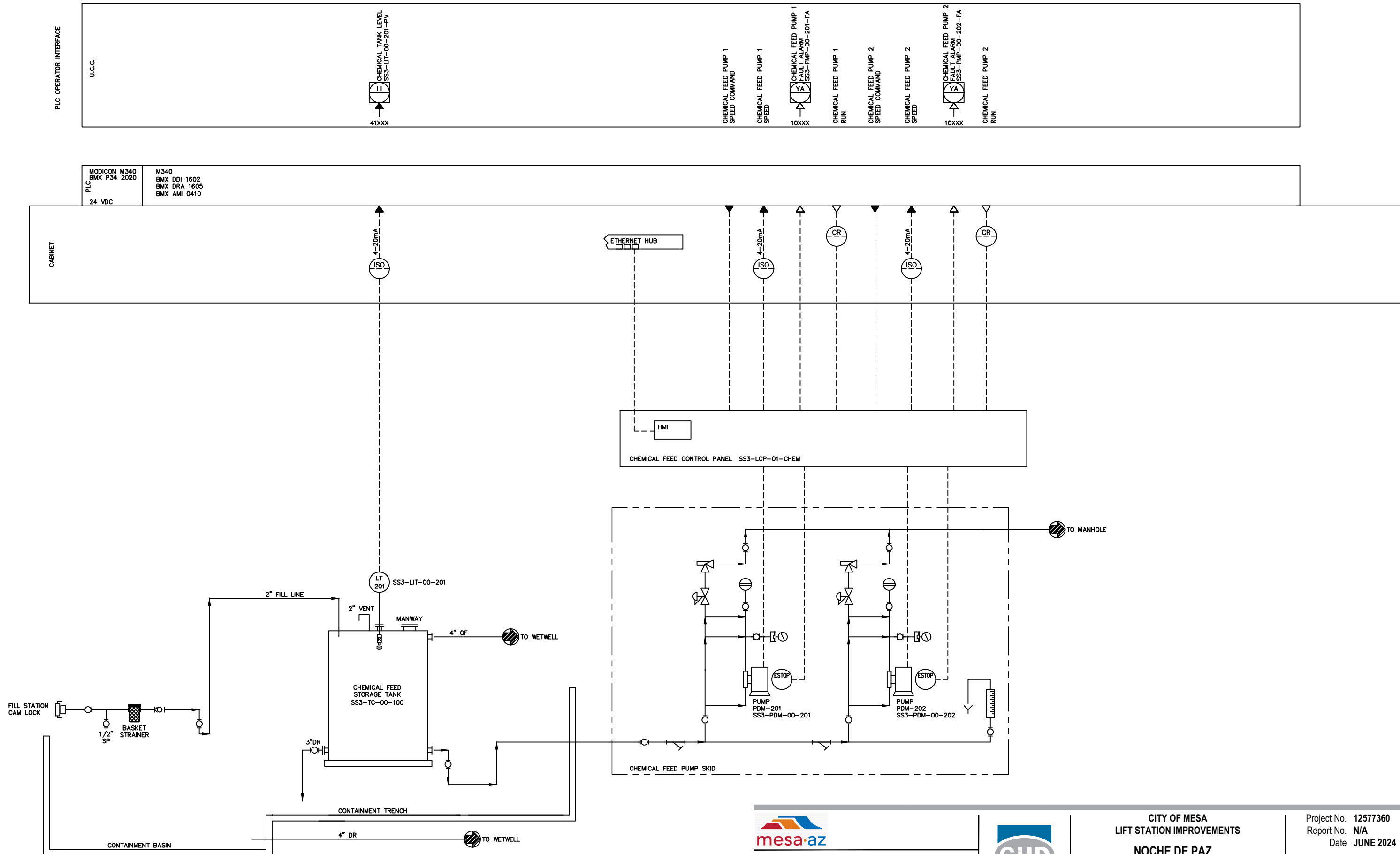
Project No. 12577360
 Report No. N/A
 Date OCTOBER 2024



BLOWER OPERATION:
 HAND - RUNS FULL TIME
 AUTO - P1: ONLY WHEN PUMP 1 RUNS
 AUTO - P2: ONLY WHEN PUMP 2 RUNS
 AUTO - LEAD: WHEN LEAD PUMP RUNS

		CITY OF MESA LIFT STATION IMPROVEMENTS		Project No. 12577360
		NOCHE de PAZ LIFT STATION 6 PROCESS & INSTRUMENTATION DIAGRAM		Report No. N/A Date JUNE 2024
Jensen Engineering, LLC Cave Creek, Arizona Est. 1988 (480) 595-9342		FIG E2		

Filename: S:\E02017 GHD Mesa Lift Stations\Noche De Paz\DCR Noche de Paz PID Lift Station.dwg
 Plot Date: 12 June 2024 - 1:59 PM



PLC OPERATOR INTERFACE

U.C.C.



CHEMICAL FEED PUMP 1
SPEED COMMAND

CHEMICAL FEED PUMP 1
SPEED



CHEMICAL FEED PUMP 1
RUN

CHEMICAL FEED PUMP 2
SPEED COMMAND

CHEMICAL FEED PUMP 2
SPEED



CHEMICAL FEED PUMP 2
RUN

PLC
MODICON M340
BMX P34 2020
24 VDC

M340
BMX DDI 1602
BMX DRA 1605
BMX AMI 0410

CABINET

ETHERNET HUB

HMI

CHEMICAL FEED CONTROL PANEL SS3-LCP-01-CHEM

TO MANHOLE

LT 201 SS3-LIT-00-201

2" FILL LINE

2" VENT

MANWAY

4" OF

TO WETWELL

CHEMICAL FEED
STORAGE TANK
SS3-TC-00-100

3" DR

CONTAINMENT TRENCH

4" DR

TO WETWELL

CHEMICAL FEED PUMP SKID



Jensen Engineering, LLC
Cave Creek, Arizona
Est. 1988 (480) 595-9342



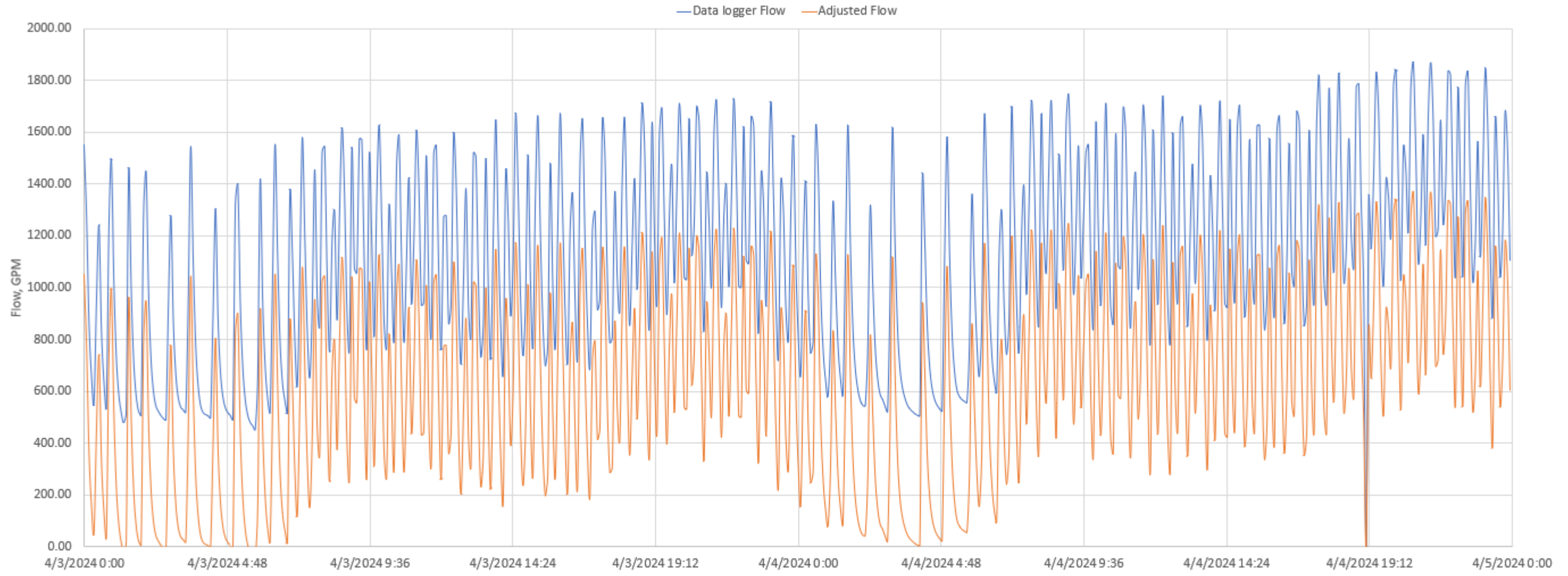
CITY OF MESA
LIFT STATION IMPROVEMENTS
NOCHE DE PAZ
SULFIDE CONTROL STATION SS3
PROCESS & INSTRUMENTATION
DIAGRAM

Project No. 12577360
Report No. N/A
Date JUNE 2024

FIG E4

Appendix B

MH716 Flow Monitoring



Appendix C

Pump Data Sheets

NP 3153 MT 3~ 434

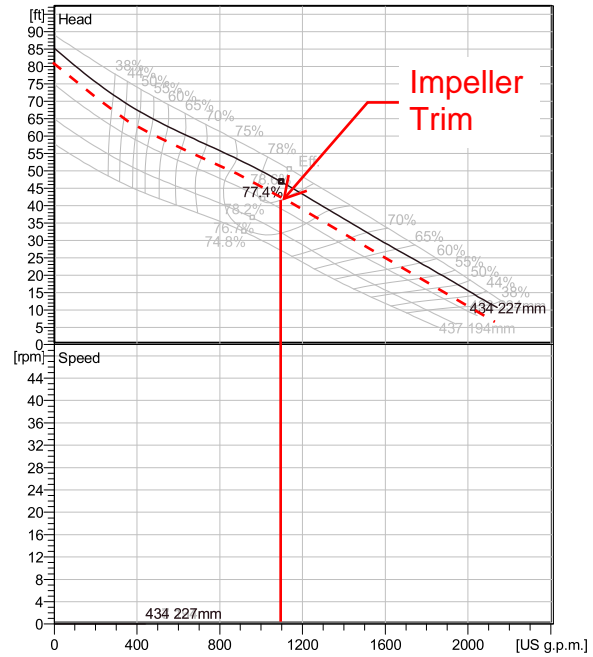
Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Modular based design with high adaptation grade.



Technical specification



Curves according to: Water, pure Water, pure [100%], 39.2 °F, 62.42 lb/ft³, 1.6891E-5 ft²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

Configuration

Motor number N3153.185 21-18-4AA-W 20hp	Installation type P - Semi permanent, Wet
Impeller diameter 227 mm	Discharge diameter 6 inch

Pump information

Impeller diameter 227 mm
Discharge diameter 6 inch
Inlet diameter 150 mm
Maximum operating speed 1755 rpm
Number of blades 2
Max. fluid temperature 40 °C

Material

Impeller
Hard-Iron™

Project	GHD ENG NOCHE DE PAS LS	Created by	ED Martin
Block	0	Created on	5/28/2024
		Last update	5/28/2024

NP 3153 MT 3~ 434

Technical specification



Motor - General

Motor number N3153.185 21-18-4AA-W 20hp	Phases 3~	Rated speed 1755 rpm	Rated power 20 hp
ATEX approved No	Number of poles 4	Rated current 26 A	Stator variant 5
Frequency 60 Hz	Rated voltage 460 V	Insulation class H	Type of Duty S1
Version code 185			

Motor - Technical

Power factor - 1/1 Load 0.83	Motor efficiency - 1/1 Load 87.5 %	Total moment of inertia 2.07 lb ft ²	Starts per hour max. 30
Power factor - 3/4 Load 0.77	Motor efficiency - 3/4 Load 89.0 %	Starting current, direct starting 148 A	
Power factor - 1/2 Load 0.66	Motor efficiency - 1/2 Load 89.0 %	Starting current, star-delta 49.3 A	

Project	GHD ENG NOCHE DE PAS LS	Created by	ED Martin		
Block	0	Created on	5/28/2024	Last update	5/28/2024

NP 3153 MT 3~ 434

Performance curve

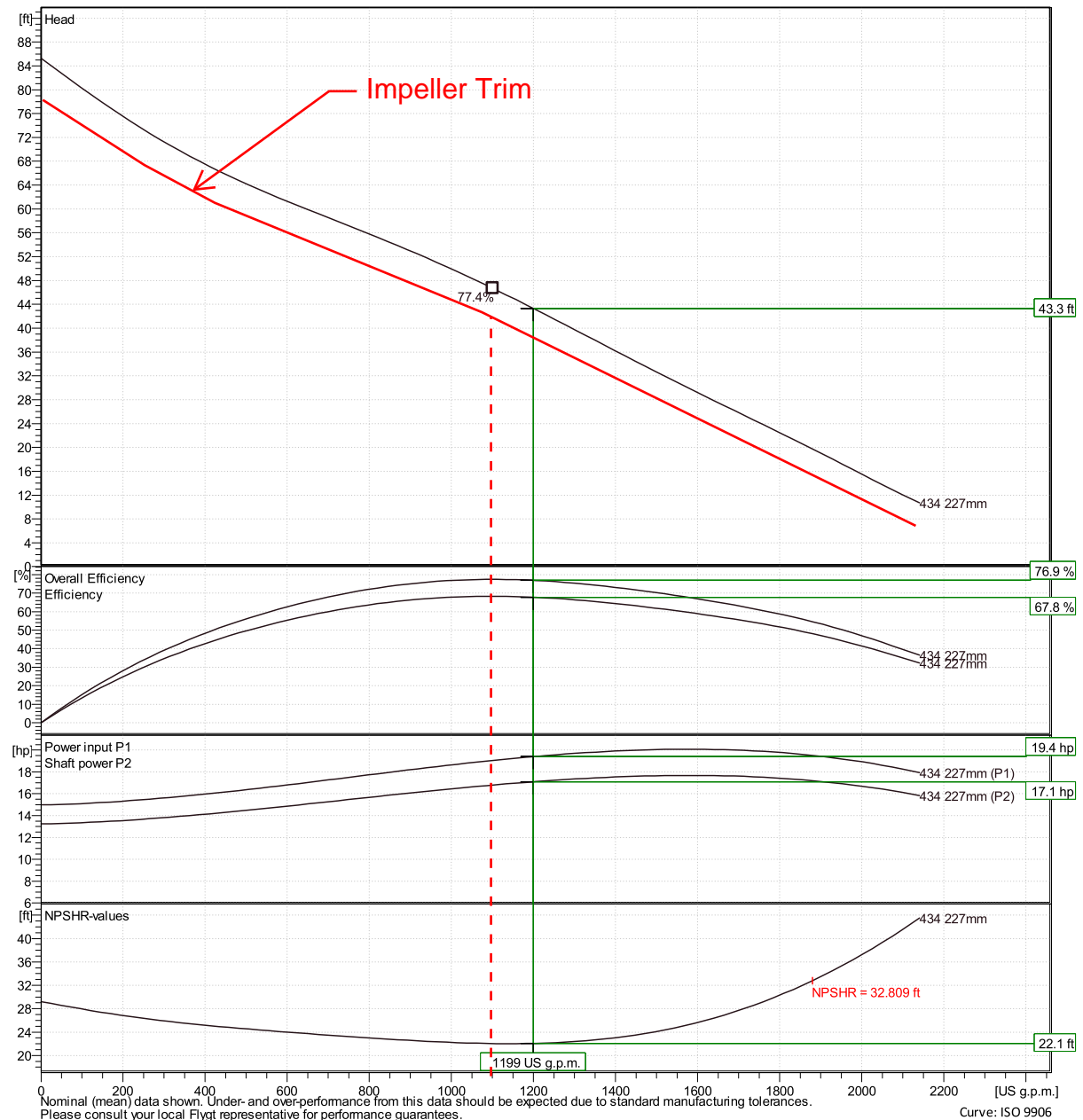


Duty point

Flow
1200 US g.p.m.

Head
43.3 ft

Curves according to: Water, pure Water, pure [100%], 39.2 °F, 62.42 lb/ft³, 1.6891E-5 ft²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

Curve: ISO 9906

GHD ENG NOCHE DE PAS LS

ED Martin

0

Created on

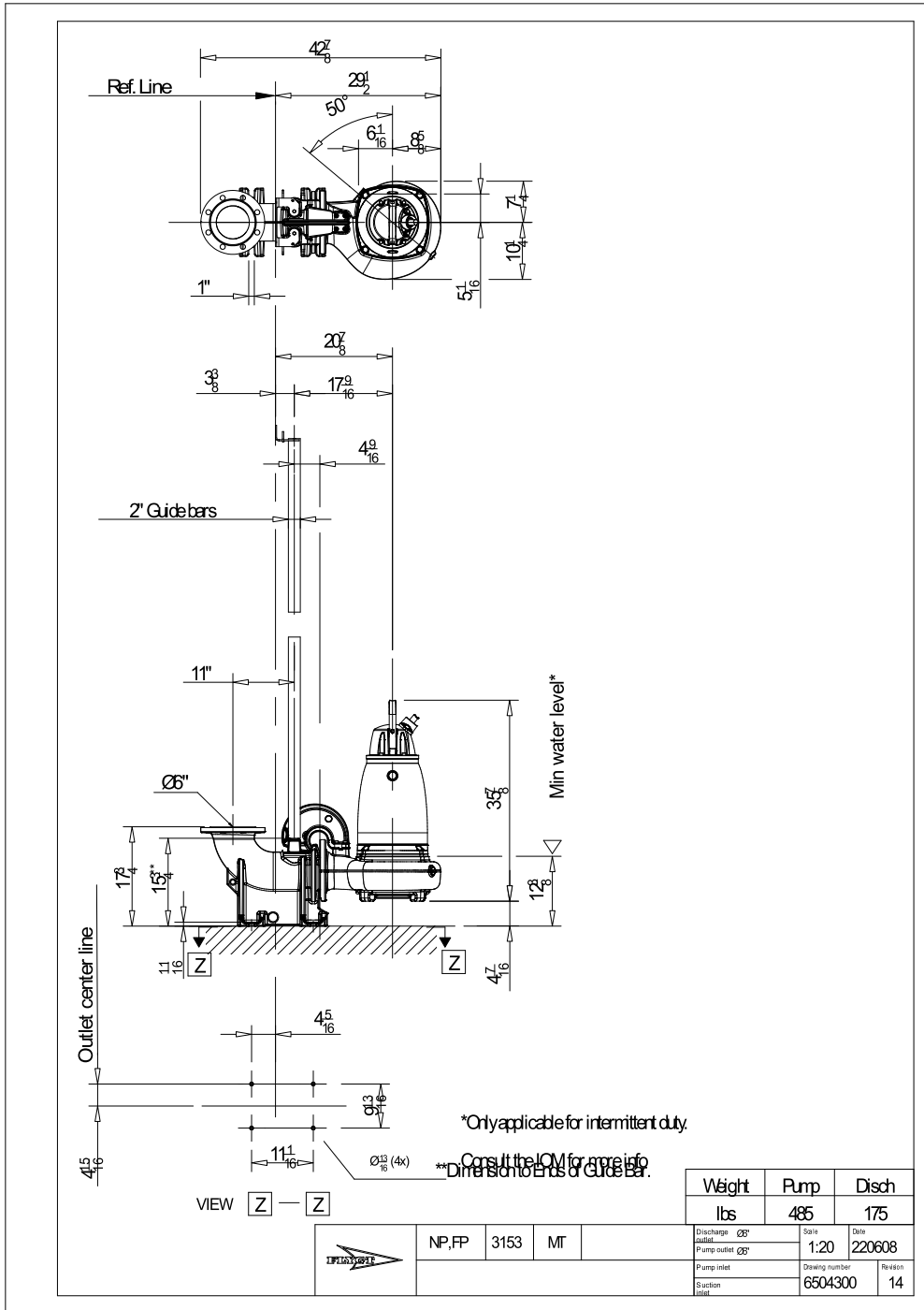
5/28/2024

Last update

5/28/2024

NP 3153 MT 3~ 434

Dimensional drawing



Weight	Pump	Disch
lbs	485	175
Discharge outlet	Ø6"	Scale
Pump outlet	Ø6"	1:20
Pump inlet	Ø6"	Date
Suction inlet	Ø6"	220608
	Drawing number	Revision
	6504300	14

Project	GHD ENG NOCHE DE PAS LS	Created by	ED Martin
Block	0	Created on	5/28/2024
		Last update	5/28/2024

Appendix D

Opinion of Cost



**New Wet Well
Noche De Paz Rehabilitation
Preliminary Opinion of Cost**



Description	Unit	Quantity	Unit Price	Total
Construction Staking and As-Builts	LS	1	\$11,400	\$11,400
Mobilization/De-Mobilization	LS	1	\$75,000	\$75,000
Utility Locating	LS	1	\$21,000	\$21,000
Demolition and Removal of Existing Piping	LS	1	\$20,000	\$20,000
Demolition and Removal of Existing Pumps	LS	1	\$6,000	\$6,000
Demolition and Removal of Chemical Containment Basin	LS	1	\$15,000	\$15,000
Demolition and Removal of Metering Pump Building	LS	1	\$5,000	\$5,000
Demolition and Removal of site Concrete	LS	1	\$5,000	\$5,000
Demolition and Removal of 10-ft Tall Slump Block Wall	LS	1	\$10,000	\$10,000
Demolition and Removal of SES, MCC and Generator	LS	1	\$6,000	\$6,000
Demolition and Removal of Wet Well & Dry Well	LS	1	\$50,000	\$50,000
Excavation & Modified Slide Rail System (18'x18'x40'D)	LS	1	\$885,700	\$885,700
Connect to Existing Manhole	EA	1	\$6,480	\$6,480
10' Tall CMU Wall	LF	60	\$450	\$27,000
Concrete Pavement	SF	300	\$25	\$7,500
1-1/2" - 1/4" DG	SY	41	\$50	\$2,050
Paint Gate and Install Synthetic Wood Slats	EA	2	\$3,000	\$6,000
New Wet Well Cover and Hatch	EA	1	\$10,000	\$10,000
Wet Well Wizard	LS	1	\$17,000	\$17,000
Recoat Existing Outlet MH	SF	144	\$30	\$4,320
Recoat Existing Inlet MH	SF	515	\$30	\$15,450
New 10' Diameter, 38.2 ft Deep Wet Well	EA	1	\$140,000	\$140,000
Coat New 10' Diameter Wet Well	SF	1200	\$30	\$36,000
Submersible Pump Assembly W/ Stainless Steel Rails and Lifting Chains	EA	2	\$40,000	\$80,000
Submersible Pump for Backup Storage	EA	1	\$30,000	\$30,000
8" DIP Force Main	LF	70	\$310	\$21,700
8" DIP 90 Bend	EA	5	\$2,000	\$10,000
8" DIP Tee	EA	2	\$1,200	\$2,400
8" Cam-Lock	EA	1	\$2,000	\$2,000
6" x 8" DIP 90 Bend Reducer	EA	2	\$1,500	\$3,000
8" Plug Valve	EA	4	\$2,738	\$10,950
8" Swing Check Valve	EA	2	\$4,994	\$9,988
8" Ultrasonic Flow Meter	EA	1	\$14,675	\$14,675
8" PVC Force Main Piping + Fittings	LF	50	\$400	\$20,000
New 2" Water Service	LS	1	\$5,000	\$5,000
2" H-Tec Air Release Valve, SS	EA	3	\$2,625	\$7,875
Pipe and Equipment Coating	LS	1	\$30,000	\$30,000
Pipe Support	EA	3	\$2,600	\$7,800
Temporary Sewer Bypass Pumping	LS	1	\$165,000	\$165,000
CIPP ex. 21" VCP Overflow Pipe	LF	90	\$800	\$72,000
Emergency Eyewash Station	EA	3	\$1,850	\$5,550
New 6,000 Gallon Fiberglass Tank	EA	1	\$40,000	\$40,000
Reinforced Concrete - Chemical Containment Basin	CY	20	\$2,040	\$40,800
8'Wx13'Lx10'H Precast Concrete Building without Floor	EA	1	\$85,000	\$85,000
Reinforced Concrete - Building Foundation	CY	15	\$1,560	\$23,400
Coat Chemical Containment Area and building floor	SF	1080	\$30	\$32,400
New Chemical Metering Pump Skid	EA	1	\$62,500	\$62,500
Temporary Chemical Storage & Metering Pumps	LS	1	\$30,000	\$30,000
Electrical Improvements & Generator	LS	1	\$344,577	\$344,577
Subtotal				\$2,538,515
Project Contingency	10%			\$253,851
Market Escalation Factor	15%			\$380,777
Overhead & Profit	15%			\$475,971
Bond & Insurance	3%			\$95,194
Total				\$3,744,309



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

Karl Tobin
Karl.Tobin@ghd.com
602.216.7236

www.ghd.com